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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/812,132	03/29/2004	Jens Peter Wittenburg	PD030014	2177

24498 7590 10/05/2006

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EXAMINER
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LI, AIMEE J

ART UNIT	PAPER NUMBER
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2183

DATE MAILED: 10/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/812,132

Applicant(s)

WITTENBURG ET AL.

Examiner

Aimee J. Li

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on 29 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 29 March 2004.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. Claims 1-8 have been considered.

#### ***Papers Submitted***

2. It is hereby acknowledged that the following papers have been received and placed of record in the file: Abstract as received on 29 March 2004; Specification as received on 29 March 2004; Drawings as received on 29 March 2004; Oath and Declaration as received on 29 March 2004; Claims as received on 29 March 2004; IDS as received on 29 March 2004; and Certified Copy of Foreign Patent Application as received on 29 March 2004.

#### ***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Drawings***

4. The drawings are objected to because there are informalities in the figures, such as handwritten labels. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after

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the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-8 are rejected under 35 U.S.C. 102(b) as being taught by Pomerene et al., U.S. Patent Number 4,903,196 (herein referred to as Pomerene).

7. Regarding claims 1 and 5, taking claim 1 as exemplary, Pomerene has taught method for pipeline processing a chain of processing instructions, including the step:

- a. Processing said instructions in a chain of succeeding pipeline stages, wherein partial or intermediate first pipeline processing operands or results are intermediately or permanently stored in a operand/result store, e.g. in a register file, for further access at the appropriate time instant or instants by one or more of said pipeline stages (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2),
- b. And wherein partial or intermediate second pipeline processing operands or results available in one or more of said pipeline stages are accessed by one or

more other ones of said pipeline stages at the appropriate time instant or instants without access to said operand/result store (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2),

- c. And wherein a scoreboard is used in which information is stored about the presence or said partial or intermediate operands or results required absence of specific ones of first pipeline processing by subsequent pipeline processing (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2),
- d. And wherein in said scoreboard data are stored and updated about in which one or ones of said pipeline stages a currently required operand or result, or currently required operands or results, is - or are - located available for use in one or more other ones of said pipeline stages (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2),
- e. And in that in said scoreboard, data are stored and updated about the type of instruction that is related to said currently required operand or result, or currently required operands or results, wherein said one or more other ones of said pipeline stages makes - or make - use of said data about location and said data about

instruction type for accessing directly said currently required operand or result, or currently required operands or results, without need to access data stored in said operand/result store (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2).

8. Claim 5 contains similar limitations as claim 1 and is rejected for similar reasons.

9. Regarding claims 2 and 6, taking claim 2 as exemplary, Pomerene has taught method according to claim 1, wherein said scoreboard contains an individual incrementer for each address of a register in said operand/result store (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2). Claim 6 contains similar limitations as claim 2 and is rejected for similar reasons.

10. Regarding claims 3 and 7, taking claim 3 as exemplary, Pomerene has taught method according to claim 2, wherein the first one of said pipeline stages writes a zero value at the address of a destination register in said scoreboard upon a processing instruction entering said first pipeline stage, and all stage counters related to processing instruction that had previously entered said first pipeline stage are incremented every new cycle if the corresponding pipeline stages are not stalled, such that the current pipeline stage counting number is kept up-to-date, and wherein, upon a processed processing instruction leaving the last pipeline stage of said chain of pipeline stages, said pipeline stage counting number is set to an end value that is no more incremented (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines

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14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2). Claim 7 contains similar limitations as claim 3 and is rejected for similar reasons.

11. Regarding claims 4 and 8, taking claim 4 as exemplary, Pomerene has taught method according to claim 1 or 2, wherein said chain of pipeline stages, except said first and the last pipeline stage, feed partial or intermediate second pipeline processing operands or results available in one or more of said pipeline stages to a common bus from which said partial or intermediate second pipeline processing operands or results can be accessed by one or more other ones of said pipeline stages at the appropriate time instant or instants without access to said operand/result store (Pomerene Abstract; column 1, lines 46-62; column 2, lines 12-25; column 4, lines 14-24 and 45-60; column 5, lines 49 to column 6, line 8; column 5, lines 40-63; column 7, line 1 to column 8, line 36; Figure 1; and Figure 2). Claim 8 contains similar limitations as claim 4 and is rejected for similar reasons.

### *Conclusion*

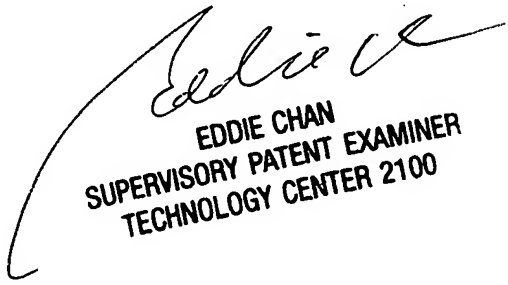
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure as follows. Applicant is reminded that in amending in response to a rejection of claims, the patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and the objections made. Applicant must also show how the amendments avoid such references and objections. See 37 CFR § 1.111(c).

- a. Brown, III et al., U.S. Patent Number 5,488,730, has a scoreboard in a pipelined system.

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- b. Leung, U.S. Patent Number 5,784,588 and 5,790,827, has taught a dependency checking scoreboard in a pipelined system.
  - c. North et al., U.S. Patent Number 6,912,557, has taught a scoreboard system.
  - d. Moy et al., U.S. Patent Number 6,947,047, has taught a pipelined system with an associated scoreboard.
13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aimee J. Li whose telephone number is (571) 272-4169. The examiner can normally be reached on M-T 7:30am-5:00pm.
14. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4162. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.
15. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AJL  
Aimee J. Li  
29 September 2006

  
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